CLAIMS

What is claimed is:

1. An antenna array, comprising:

an array of continuous slots formed in a ground plane structure;

a feed structure comprising a set of probe feeds disposed at spaced locations behind the ground plane structure.

2. The array of Claim 1, wherein the probes are spaced apart by a spacing no greater than one half wavelength at the highest operating frequency.

3. The array of Claim 1, further comprising an electrically conductive back plane structure arranged behind the probe feeds such that the probe feeds are between the ground plane structure and the back plane structure, the back plane structure providing RF shielding.

4. The array of Claim 3, wherein the feed structure comprises a balanced push-pull feed coupled to each of the probe feeds and comprising a pair of feed lines driven in anti-phase.

5. The array of Claim 4, further comprising an impedance transformer for coupling a low impedance transmission structure to a higher load impedance of the continuous slots.

6. The array of Claim 5, wherein the impedance transformer comprises a stripline impedance transformer circuit positioned behind the back plane structure.

7. The array of Claim 6, wherein the stripline impedance transformer circuit transforms an impedance of 50 ohms into the load impedance of the continuous slot.

8. The array of Claim 1, wherein said ground plane structure is a planar structure.

9. The array of Claim 1, wherein the probe feeds each comprise a pair of feed wires each connected to a feed wire portion which is positioned in a general parallel orientation relative to the ground plane structure.

10. The array of Claim 1, further comprising spaced short posts inside and underneath each slot along slot edges.

11. The array of Claim 1, wherein the array operates in a UHF operating band.

12. The array of Claim 1, wherein the array operates in a band between 4 Ghz and 16 Ghz.

13. A dual polarization antenna array, comprising:

a first array of continuous slots formed in a ground plane structure;

a second array of continuous slots formed in the ground plane structure, said second array orthogonal to said first array to define a checker-board pattern of conductive pads in the ground plane structure;

a first feed structure comprising a first periodically spaced set of probe feeds disposed behind the ground plane structure for exciting the first array of slots;

a second feed structure comprising a second periodically spaced set of probe feeds disposed behind the ground plane structure for exciting the second array of slots.

14. The array of Claim 13, further comprising an electrically conductive back plane structure arranged behind the first and second sets of probe feeds such that the probe feeds are between the ground plane structure and the back plane structure, the back plane structure providing RF shielding.

15. The array of Claim 14, wherein each of the first and second feed structures comprises a balanced push-pull feed respectively coupled to each of the first and second sets of probe feeds and comprising a pair of feed lines driven in anti-phase.

16. The array of Claim 15, further comprising an impedance transformer for coupling a low impedance transmission structure to a higher load impedance of the continuous slots.

17. The array of Claim 16, wherein the impedance transformer comprises a stripline impedance transformer circuit positioned behind the back plane structure.

18. The array of Claim 17, wherein the stripline impedance transformer circuit transforms an impedance of 50 ohms into the load impedance of the continuous slot.

19. The array of Claim 13, wherein said ground plane structure is a planar structure.

20. The array of Claim 13, wherein the probe feeds each comprise a pair of feed wires each connected to a feed wire portion which is positioned in a general parallel orientation relative to the ground plane structure.

21. The array of Claim 13, wherein the array operates in a band between 4 Ghz and 16 Ghz.

22. An antenna array, comprising:

an array of continuous slots formed in a conductor plane structure;

a balanced push-pull feed structure for exciting the array of continuous slots, the balanced push-pull feed structure comprising a periodic set of probe feeds disposed behind the ground plane structure; and

a back plane structure comprising a conductive layer disposed behind the set of probe feeds and spaced a distance S1 from the conductor plane structure, such that the set of probe feeds is sandwiched between the conductor plane structure and the back plane structure.

23. The array of Claim 22, wherein the antenna array has an operating band, and wherein said distance S1 is greater than 12% of a mid-band wavelength and less than 60% of the mid-band wavelength.

24. The array of Claim 22, wherein the balanced push-pull feed is coupled to each of the probe feeds and comprising a pair of feed lines driven in anti-phase for each probe feed.

25. The array of Claim 22, further comprising an impedance transformer for coupling a low impedance transmission structure to a higher load impedance of the continuous slots.

26. The array of Claim 25, wherein the impedance transformer comprises a stripline impedance transformer circuit positioned behind the back plane structure.

27. The array of Claim 26, wherein the stripline impedance transformer circuit transforms an impedance of 50 ohms into the load impedance of the continuous slot.

28. The array of Claim 22, wherein said ground plane structure is a planar structure.

29. The array of Claim 22, wherein the array operates in a UHF operating band.

30. The array of Claim 22, wherein the array operates in a band between 4 Ghz and 16 Ghz.

31. The array of Claim 22, wherein said probe feeds are spaced apart by a spacing no greater than one half wavelength at the highest operating frequency.